62. The method of claim 61 wherein said generating comprises generating said pump beam pulse having a wavelength of about one micron.

63. The method of claim 61 wherein said generating comprises generating said pump beam pulse such that said pulse has a duration of less than about 30 nanoseconds.

64. The method of claim 61 wherein said generating comprises generating said pump beam as a multi mode beam.

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65. (Once Amended) The method of claim 61 wherein said generating comprises generating said pump beam pulse as a multi mode beam having a divergence greater than eight times a diffraction limit of said multi mode beam.

66. The method of claim 61 wherein said pump beam pulse has a diameter on the order of one to five millimeters.

67. The method of claim 61 wherein said impinging comprises impinging said idler beam pulse on corneal tissue.

68. The method of claim 61 further comprising sculpting a cornea with a plurality of idler beam pulses.

69. The method of claim 61 further comprising cutting said KTP crystal for type II phase matching, and internal angles of sixty eight to seventy degrees.

70. The method of claim 61 wherein said generating comprises generating said pump beam pulse in one of a Nd: YAG, Nd:glass, Nd:YLF, and Nd:YAlO3 laser.

71. The method of claim 61 further comprising cutting said KTP crystal to have a length of at least 20 millimeters.

72. The method of claim 61 wherein said KTP crystal has a principle axis, and further comprising rotating said KTP crystal relative to said principle axis.

73. The method of claim 61 wherein said step of transmitting comprises transmitting said idler beam pulse with an energy of between five and thirty milli joules.

74. The method of claim 61 wherein said KTP crystal has a principle axis, and further comprising rotating said KTP crystal relative to said principle axis to an absorption wavelength of said tissue.

75. The method of claim 61 wherein said KTP crystal converts at least one tenth of energy in said pump beam pulse into said idler beam pulse.

76. The method of claim 61 further comprising generating pump beam pulses at a

rate of ten to fifty hertz.

77. The method of claim 61 further comprising transmitting remainder of said pump beam pulse exiting said KTP crystal through a second KTP crystal.

78. The method of claim 61 further comprising transmitting said pump beam to said KTP crystal via one of a waveguide and a fiber optic bundle.

79. The method of claim 78 further comprising interlacing an idler beam pulse output generated in a second KTP crystal with said idler beam pulse.

80. (Once Amended) A surgical method, comprising:

generating a pump beam pulse;

transmitting said pump beam pulse through a mirror that is highly reflective to a wavelength of an idler beam pulse and highly transmissive to a wavelength of said pump beam pules, said mirror oriented at an angle of forty five degrees relative to said pump beam pulse;

transmitting said pump beam pulse into a crystal;

wherein said crystal converts a fraction of energy in said pump beam pulse into said idler beam pulse, and said idler beam pulse wavelength is about 2.90 and about 3.0 microns; and

impinging said idler beam pulse on tissue, thereby removing said tissue.

81. (Once Amended) A surgical method, comprising:

generating a pump beam pulse;

transmitting said pump beam pulse into a periodically poled KTP crystal;

wherein said KTP crystal converts a fraction of energy in said pump beam pulse into an idler beam pulse, and said idler beam pulse has a wavelength of between about 2.75 and about 3.0 microns; and

impinging said idler beam pulse on tissue, thereby removing said tissue.

82. (Once Amended) A surgical method, comprising:

generating a pump beam pulse;

transmitting said pump beam pulse into a periodically poled $LiNbO_3$ crystal;

wherein said periodically poled $LiNbO_3$ crystal converts a fraction of energy in said pump beam pulse into an idler beam pulse, and said idler beam pulse has a wavelength of between about 2.9 and about 3.0 microns; and

impinging said idler beam pulse on tissue, thereby removing said tissue.

83. (Once Amended) A surgical method, comprising:

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generating a pump beam pulse at a wavelength of between about 0.85 and 0.90 microns;

transmitting said pump beam pulse into a non critically phase matched KTP crystal, X-cut;

wherein said non critically phase matched KTP crystal converts a fraction of energy in said pump beam pulse into an idler beam pulse, and said idler beam pulse has a wavelength of between about 2.9 and about 3.0 microns; and

impinging said idler beam pulse on tissue, thereby removing said tissue.

84. The method of claim 83 wherein said generating comprises generating said pump beam pulse in one of a Ti: Sapphire and a Cr: LiSAF laser.

Please add the following NEW claims 85-91.

Rule 126 E4

90 ~~85~~. (New) A surgical method, comprising:

generating a pump beam pulse;

transmitting said pump beam pulse into a crystal along a propagation direction;

wherein said crystal converts a fraction of energy in said pump beam pulse into an idler beam pulse, and said idler beam pulse has a wavelength of between about 2.75 and about 3.0 microns, a pulse width of not more than 50 nanoseconds, and an energy of at least 5 millijoules; and

impinging said idler beam pulse on tissue, thereby removing said tissue.

91 ~~86~~. (New) The method of claim 90 ~~85~~ wherein said step of generating said pump beam comprises generating said pump beam at a pulse duration of not more than 50 nanoseconds.

92 ~~87~~. (New) The method of claim 90 ~~85~~ wherein said step of generating said pump beam comprises generating said pump beam at a wavelength of about one micron.

93 ~~88~~. (New) The method of claim 92 ~~87~~ wherein said step of generating said pump beam comprises generating said pump beam with an energy of no more than 30 millijoules per pulse.

Rule 126

94 ~~89~~. (New) The method of claim ~~85~~ 90 further comprising rotating said crystal relative to said propagation direction.

95 ~~90~~. (New) The method of claim 61 wherein said idler beam pulse has a wavelength of between about 2.90 and about 3.0 microns.

96 ~~91~~. (New) The method of claim 80 wherein said idler beam pulse has a wavelength of between about 2.90 and about 3.0 microns.